

## HIGH TEMPERATURE JOINTS FOR DISSIMILAR MATERIALS

## ABSTRACT

5 Composite joints for gas-tight members that exhibit  
different coefficients of thermal expansion are disclosed. Broadly,  
apparatus of the invention provides composite joints which  
include a girdle of a resilient material disposed between mating  
10 surfaces of a high strength metallic member and a nonmetallic  
member in an arrangement wherein a difference in fluid  
pressures across the joint provides compressive force upon the  
girdle through tapered mating surfaces thereby improving  
resistance to fluid leakage. Composite joints of the invention are  
15 particularly useful for joining a high strength weldable metallic  
conduit and a gas-tight ceramic member having a tubular  
structure, closed at one end, with a tapered mating surface at a  
distal end thereof contiguous with a portion of the girdle.

Processes beneficially using joints in accordance with the  
invention include converting methane gas into value-added-  
20 products, for example, production of synthesis gas comprising  
carbon monoxide and molecular hydrogen. Advantageously, the  
synthesis gas is free of deleterious and/or inert gaseous diluents  
such as nitrogen.

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